

The coordination of microtubule-dependent motors during axonal transport.

<https://www.neurodegenerationresearch.eu/survey/the-coordination-of-microtubule-dependent-motors-during-axonal-transport/>

Name of Fellow

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Institution

Funder

Wellcome Trust

Contact information of fellow

Country

United Kingdom

Title of project/programme

The coordination of microtubule-dependent motors during axonal transport.

Source of funding information

Wellcome Trust

Total sum awarded (Euro)

€ 338,950

Start date of award

12/12/11

Total duration of award in years

5.0

The project/programme is most relevant to:

Neurodegenerative disease in general

Keywords

Alzheimer | Amyotroph | Dementia | Huntington | Motor Neuron

Research Abstract

My aim is to understand how a direct interaction between the kinesin and dynein motors affects

the activity and motility of each, at both the single molecule and cellular level, to discover how this regulates the delivery of axonal cargoes. Initially, I will use biochemical techniques to characterise the interaction between kinesin-1 and dynein and then use this information to target mutations in the kinesin-1 protein. Multiple parameters will then be used to measure the motility of single molecules of fluorescently-labelled dynein and kinesin motors in vitro via a range of microscopy techniques. Following on from these single molecule methods, I will develop embryonic stem (ES) cells that express exogenous dynein with kinesin-1 binding domain mutations in the absence of endogenous dynein (which will be deleted through Cre-mediated recombination). Movements of dynein motors and axonal cargoes will then be analysed in motor neurons differentiated from mutant ES cells. If these experiments are successful, transgenic mice will be generated from the ES cells with the endogenous dynein subunit deleted only in specific subsets of neurons (e.g. sensory and motor neurons) so that axonal transport can be imaged in vivo in the sciatic nerve.

Types:

Fellowships

Member States:

United Kingdom

Diseases:

Neurodegenerative disease in general

Years:

2016

Database Categories:

N/A

Database Tags:

N/A